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EXAMINER	
YUEN, KAN	

ART UNIT	PAPER NUMBER
2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/775,529	BARRASS, HUGH	
	Examiner	Art Unit	
	KAN YUEN	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

Claim Objections

1. Claims 2, 3 are objected to because of the following informalities:

2. In claim 2, line 2, the term “and links” seemed to be redundant. Applicant is suggested to delete the term “and links". Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 4, 5, 15, 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Agazzi (Pub No.: 2004/0184518).

For claims 1 Agazzi disclosed the method of a PHY (fig. 7, transceiver 20) comprising:

a transceiver section (fig. 7, transceiver 20) for each of the plurality of transmission lines (fig. 7, twisted pairs 18), the transceiver section has an input path and an output path and the transceiver section is capable of communicating and diagnosing (Agazzi paragraph 0061). The master receiver includes a signal

detector 41 which detects energy in the line coming from the salve. The master transitions from the first phase to the second phase when it detects this energy from the salve. Thus, the signal detector is able to diagnosing;

the input path comprising a receiver (fig. 7, hybrid 26) having an input coupled to the corresponding link, an analog-to-digital converter (ADC) (fig. 7, A/D converter 42) having an input coupled to an output of the receiver, at least one far end cross talk (FEXT)/near end cross talk (NEXT) canceller section (fig. 7, FEXT canceller 70 or NEXT canceller 38), an alien noise canceller section (fig. 7, Echo canceller 40), and an equalizer section (fig. 7, Detector 58); and

the output path comprising a coding and preconditioning section (fig. 7, Pulse shaping 32), a digital-to- analog converter (DAC) (fig. 7, D/A/ converter 34) having an input coupled to an output of the coding and preconditioning section, and a transmitter (fig. 7, hybrid 26) having an input coupled to an output of the DAC and having an output coupled to the corresponding link (Agazzi paragraphs 0044-0048).

Regarding claim 2, Agazzi disclosed the feature wherein the cable comprises four transmission lines and links and the PHY comprises four transceiver sections with one transceiver section for each link (fig. 7, 4x transceivers 20 and 4x twisted pairs 18).

Regarding claim4, Agazzi disclosed the feature wherein the PHY performs cable diagnostics without a link partner (paragraph 0019-0021). Each transceiver is having a noise reduction system, a timing recovery system and at least one equalizer. The startup protocol includes the transition steps of transmitting a

signal from the slave to the master, wherein the master can detects the signal by its own.

Regarding claim 5, Agazzi disclosed the feature wherein the PHY performs cable diagnostics to characterize signal attenuation of at least one of the plurality of links (paragraphs 0016-0018). By separating the convergence of the equalizer and the timing recovery system from the convergence of the noise reduction (signal attenuation) system the interaction among the various adaptation and acquisition algorithms within the transceiver is reduced. As a result, the reliability of the convergence and synchronization operations is improved.

Regarding claim 15, Agazzi disclosed the feature wherein the PHY performs cable diagnostics with at least a second PHY as a link partner (paragraphs 0023). To perform the startup protocol, a first transceiver acts as a master, and second one acts as a slave.

Regarding claim 16, Agazzi disclosed the feature wherein the PHY performs cable diagnostics to characterize at least one of the plurality of links by examining a profile of a signal that is received by the receiver of the PHY (paragraphs 0016-0018). Transmitting a signal from the salve to the master; detecting (examining) the signal at the master.

Claim Rejections - 35 USC § 103

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 3, 20-22, 32, 33, 37-39, 49, 50 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Agazzi (Pub No.: 2004/0184518).

For claim 3, Agazzi disclosed the feature wherein, taken together, the four transceiver sections (fig. 7, 4 x transceivers 20) comprise four receivers (fig. 7, 4 x hybrids 26), four ADCs (fig. 7, 4x A/D 34), six FEXT/NEXT canceller sections (fig. 7, 4x FEXT cancellers, or 4x NEXT cancellers 38), one alien noise canceller section (fig. 7, Echo canceller 40), four equalizer sections (fig. 7, 4x Detector 58), four coding and preconditioning sections (fig. 7, 4x Pulse shaping 32), four DACs (fig. 7, 4x D/A/ converter 34), and four transmitters (fig. 7, 4 x hybrids 26).

However, Agazzi did not disclose six FEXT/NEXT canceller sections. Although Agazzi did not disclose exactly six FEXT/NEXT canceller sections, however using plurality of FEXT/NEXT canceller sections is considered as a design choice, and therefore it would have been obvious to a person of ordinary skill in the art at the time of the invention to use six FEXT/NEXT canceller sections in the network of Agazzi. The motivation for using six FEXT/NEXT canceller sections in the network of Agazzi being that it increases the converging period of timing recovery system.

Regarding claim 20, Agazzi disclosed the system comprises a physical layer device (PHY) (fig. 7, transceiver 20) and four transmission lines (fig. 7, twisted pairs 18), that each form a corresponding link for a total of four links (fig. 7, 4x twisted pairs 18), each of the transmission lines is coupled to the PHY, the PHY comprises:

a transceiver section (fig. 7, transceiver 20) for each of the transmission lines for a total of four transceiver sections (fig. 7, 4 x transceivers 20), the four transceiver sections combined comprise four receivers (fig. 7, 4 x hybrids 26), four analog-to-digital converters (ADC) (fig. 7, 4x A/D 34), six far end cross talk (FEXT)/near end cross talk (NEXT) canceller sections (fig. 7, 4x FEXT cancellers, or 4x NEXT cancellers 38), an alien noise canceller section (fig. 7, Echo canceller 40), four equalizer sections (fig. 7, 4x Detector 58), four coding and preconditioning sections (fig. 7, 4x Pulse shaping 32), four digital-to-analog converters (DAC) (fig. 7, 4x D/A/ converter 34), and four transmitters (fig. 7, 4 x hybrids 26) and (Agazzi paragraphs 0044-0048), the method comprising:

performing cable diagnostics by utilizing the PHY to characterize at least one of the four links (Agazzi paragraph 0061). The master receiver includes a signal detector 41 which detects energy in the line coming from the salve. The master transitions from the first phase to the second phase when it detects this energy from the salve. Thus, the signal detector is able to diagnosing.

However, Agazzi did not disclose six FEXT/NEXT canceller sections. Although Agazzi did not disclose exactly six FEXT/NEXT canceller sections, however using plurality of FEXT/NEXT canceller sections is considered as a design choice, and therefore it would have been obvious to a person of ordinary skill in the art at the time of the invention to use six FEXT/NEXT canceller sections in the network of Agazzi. The motivation for using six FEXT/NEXT canceller sections in the network of Agazzi being that it increases the converging period of timing recovery system.

Regarding claims 21, 38 Agazzi disclosed the feature wherein the PHY operates without a link partner (paragraph 0019-0021). Each transceiver is having a noise reduction system, a timing recovery system and at least one equalizer. The startup protocol includes the transition steps of transmitting a signal from the slave to the master, wherein the master can detects the signal by its own.

Regarding claims 22, 39 Agazzi disclosed the feature wherein performing cable diagnostic includes characterizing signal attenuation of at least one of the four links (paragraphs 0016-0018). By separating the convergence of the equalizer and the timing recovery system from the convergence of the noise

reduction (signal attenuation) system the interaction among the various adaptation and acquisition algorithms within the transceiver is reduced. As a result, the reliability of the convergence and synchronization operations is improved.

Regarding claims 32, 49 Agazzi disclosed the feature wherein the PHY performs cable diagnostics with at least a second PHY as a link partner (paragraphs 0023). To perform the startup protocol, a first transceiver acts as a master, and second one acts as a slave.

Regarding claims 33, 50 Agazzi disclosed the feature wherein performing cable diagnostics includes characterizing at least one of the four links by examining a profile of a signal that is received by at least one of the four receivers of the PHY (paragraphs 0016-0018). Transmitting a signal from the salve to the master; detecting (examining) the signal at the master.

Claim 37 is rejected similar to claim 20.

8. Claims 6, 23, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agazzi (Pub No.: 2004/0184518), In view of Propp et al. (Pub No.: 2005/0063479).

For claims 6, 23, 40 Agazzi did not disclose the feature wherein the PHY performs cable diagnostics to characterize signal attenuation versus frequency of at least one of the plurality of links. Propp et al. from the same or similar fields of endeavor teaches wherein the PHY performs cable diagnostics to

characterize signal attenuation versus frequency of at least one of the plurality of links (Propp et al. paragraph 0034). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use the feature as taught by Propp et al. in the network of Agazzi. The motivation for using the feature as taught by Propp et al. in the network of Agazzi being that it may be predictable based upon the models of the particular cable.

9. Claims 7, 24, 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agazzi (Pub No.: 2004/0184518), In view of Barksdale, Jr. (Pub No.: 2003/0194001).

For claim 7, 24, 41 Agazzi did not disclose the feature wherein the PHY performs cable diagnostics to characterize a length for at least one of the plurality of links. Barksdale, Jr. from the same or similar fields of endeavor teaches wherein the PHY performs cable diagnostics to characterize a length for at least one of the plurality of links (Barksdale paragraph 0089). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use the feature as taught by Barksdale et al. in the network of Agazzi. The motivation for using the feature as taught by Barksdale et al. in the network of Agazzi being that it may provides packet loss based on the measured cable length.

10. Claims 8, 9, 17, 25, 26, 34, 42, 43, 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agazzi (Pub No.: 2004/0184518), In view of Kerpez (Pub No.: 2004/0095921).

For claims 8, 25, 42 Agazzi did not disclose the feature wherein the PHY performs cable diagnostics to characterize FEXT coupling of at least one pair of the plurality of links. Kerpez from the same or similar fields of endeavor teaches wherein the PHY performs cable diagnostics to characterize FEXT coupling of at least one pair of the plurality of links (Kerpez paragraph 0082). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use the feature as taught by Kerpez et al. in the network of Agazzi. The motivation for using the feature as taught by Kerpez et al. in the network of Agazzi being that it may reduces noise in the network.

Regarding claims 9, 26, 43 Kerpez disclose the feature wherein the PHY performs cable diagnostics to characterize NEXT coupling of at least one pair of the plurality of links (Kerpez paragraph 0082).

Regarding claim 17, 34, 51 Kerpez disclose the feature wherein the PHY-performs cable diagnostics to characterize at least one of the plurality of links by utilizing filter coefficients of the at least one FEXT/NEXT canceller section of the PHY (Kerpez paragraph 0082).

11. Claims 10, 27, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agazzi (Pub No.: 2004/0184518), In view of Sand (Pat No.: 6512746).

For claims 10, 27, 44 Agazzi did not disclose the feature wherein the PHY performs cable diagnostics to characterize alien noise levels of at least one of the plurality of links. Sand from the same or similar fields of endeavor teaches the feature wherein the PHY performs cable diagnostics to characterize alien noise levels of at least one of the plurality of links (Sand column 7, lines 1-5). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use the feature as taught by Sand in the network of Agazzi. The motivation for using the feature as taught by Sand in the network of Agazzi being that it may reduces noise in the network.

12. Claims 11, 28, 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agazzi (Pub No.: 2004/0184518), In view of Pharn et al. (Pub No.: 2004/0251913).

For claims 11, 28, 45 Agazzi did not disclose the feature wherein the PHY performs cable diagnostics to characterize at least one of the plurality of links by utilizing Time Domain Reflectometry. Pharn et al. from the same or similar fields of endeavor teaches the feature wherein the PHY performs cable diagnostics to characterize at least one of the plurality of links by utilizing Time Domain Reflectometry (Pharn et al. paragraph 0043). Thus, it would have been obvious

to the person of ordinary skill in the art at the time of the invention to use the feature as taught by Pharn et al. in the network of Agazzi. The motivation for using the feature as taught by Pharn et al. in the network of Agazzi being that it may reduces noise in the network.

13. Claims 12, 29, 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agazzi (Pub No.: 2004/0184518), In view of Wozniak et al. (Pub No.: 2008/0013110).

For claims 12, 29, 46 Agazzi did not disclose the feature wherein the PHY performs cable diagnostics to characterize at least one of the plurality of links by utilizing continuous test tones. Wozniak et al. from the same or similar fields of endeavor teaches the feature wherein the PHY performs cable diagnostics to characterize at least one of the plurality of links by utilizing continuous test tones (Wozniak et al. paragraph 0017). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use the feature as taught by Wozniak et al. in the network of Agazzi. The motivation for using the feature as taught by Wozniak et al. in the network of Agazzi being that it may reduces noise in the network.

14. Claims 13, 30, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agazzi (Pub No.: 2004/0184518), In view of Johnson et al. (Pub No.: 2004/0184620).

For claims 13, 30, 47 Agazzi did not disclose the feature wherein the PHY performs cable diagnostics to characterize at least one of the plurality of links by utilizing filter coefficients of the equalizer section. Johnson from the same or similar fields of endeavor teaches the feature wherein the PHY performs cable diagnostics to characterize at least one of the plurality of links by utilizing filter coefficients of the equalizer section (Johnson et al. paragraph 0037). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use the feature as taught by Johnson et al. in the network of Agazzi. The motivation for using the feature as taught by Johnson et al. in the network of Agazzi being that it may increases transmission bandwidth.

15. Claims 14, 19, 31, 36, 48, 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agazzi (Pub No.: 2004/0184518), In view of Klenner (Pub No.: 2001/0026150).

For claims 14, 31, 48 Agazzi did not disclose the feature wherein the PHY performs cable diagnostics to characterize at least one of the plurality of links by lowering a transmit level of the PHY and monitoring a Bit Error Ratio to determine an alien noise level. Klenner from the same or similar fields of endeavor teaches

wherein the PHY performs cable diagnostics to characterize at least one of the plurality of links by lowering a transmit level of the PHY and monitoring a Bit Error Ratio to determine an alien noise level (Klenner paragraph 0018). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use the feature as taught by Klenner in the network of Agazzi. The motivation for using the feature as taught by Klenner in the network of Agazzi being that it may increases transmission bandwidth.

Regarding claims 19, 36, 53 Klenner disclose the feature wherein the PHY performs cable diagnostics to characterize at least one of the plurality of links by receiving a lowered transmit level from the second PHY and monitoring a Bit Error Ratio to determine an alien noise level (Klenner paragraph 0018).

16. Claims 18, 35, 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agazzi (Pub No.: 2004/0184518), In view of Nakano et al. (Pat No.: 4858224).

For claims 18, 35, 52 Agazzi did not disclose the feature wherein the PHY monitors a change in one or more of the Characteristics in at least one of the plurality of links to forecast a potential or diagnose an actual failure of at least one of the plurality of links. Nakano et al. from the same or similar fields of endeavor teaches the feature wherein the PHY monitors a change in one or more of the Characteristics in at least one of the plurality of links to forecast a

potential or diagnose an actual failure of at least one of the plurality of links (Nakano et al. column 4, lines 20-40). Thus, it would have been obvious to the person of ordinary skill in the art at the time of the invention to use the feature as taught by Nakano et al. in the network of Agazzi. The motivation for using the feature as taught by Nakano et al. in the network of Agazzi being that it may reduces transmission error rate.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAN YUEN whose telephone number is (571)270-1413. The examiner can normally be reached on Monday-Friday 10:00a.m-3:00p.m EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky O. Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ricky Ngo/
Supervisory Patent Examiner, Art Unit 2616

KY